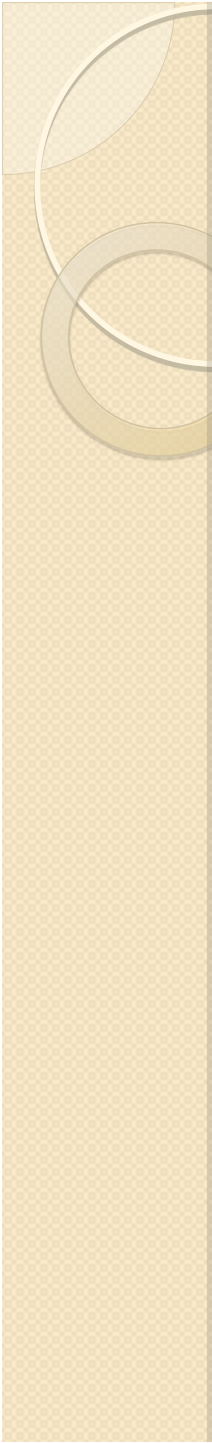




General Computer Science for Engineers CISC 106 Lecture 15

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Lecture Overview

- User Inputs
- Arrays and subarrays
- Nested Loops

User Input

- Input function displays a prompt waits for the user to respond

```
value = input('Enter an input value:')
```

Enter an input value: 1.25

Value =

1.2500

User Input

- Input function displays a prompt waits for the user to respond

```
name = input('What is your name','s')
```

```
What is your name: Pinar
```

```
name=
```

```
Pinar
```

Arrays

- Each dimension must have same length

- `a = [2 3 4; 5 6 7]`

`a = 2 3 4`

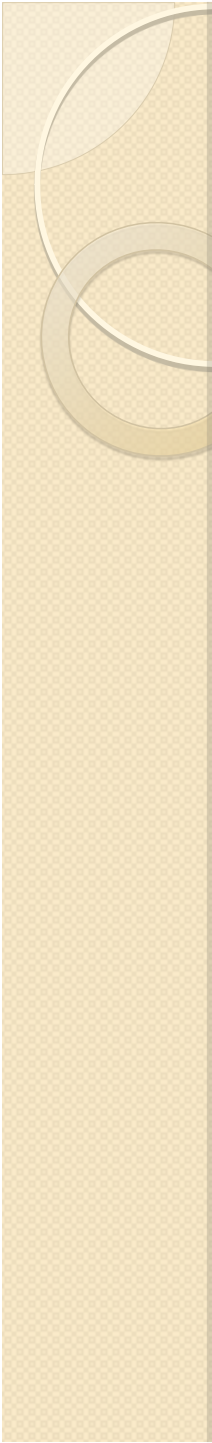
`5 6 7`

- `a = [1 2 3; 4 5]`

error!

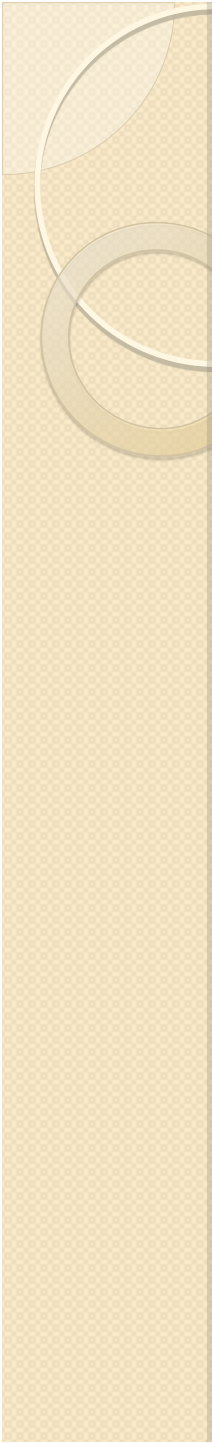
Initialize using built-in functions

- `x=zeros(2)`
- `x = 0 0`
`0 0`
- `x = zeros(2,3)`
`x = 0 0 0`
`0 0 0`



Subarrays

- It will help with problem 4 (magic squares) on the lab
- Although you do not need it, it could make life easier



isMagicSquare.m

- Problem 4 of the lab
- Boolean function is a logical function
 - Returns true or false
- Extra credit for that problem
 - Check that number in the matrix is different as well
 - <http://www.udel.edu/CIS/106/cavazos/09S/labs/lab5questions.html>

Subarrays

- It is possible to select and use subsets of MATLAB arrays.

`arr1 = [1.1 -2.2 3.3 -4.4 5.5];`

`arr1(3)` is 3.3

`arr1([1 4])` is the array [1.1 -4.4]

`arr1(1 : 2 : 5)` is the array [1.1 3.3 5.5]

Subarrays

- For 2-dimensional arrays, colon can be used .

```
arr2 = [1 2 3; -2 -3 -4; 3 4 5]
```

```
arr2(1,:)
```

```
1 2 3
```

```
arr2(:,1:2:3)
```

```
1    3
```

```
-2   -4
```

```
3    5
```

Subarrays

- end function: returns highest value taken on by that subscript

```
arr3 = [1 2 3 4 5 6 7 8]
```

```
arr3(5:end) is array [5 6 7 8]
```

Subarrays

```
arr4=[1 2 3 4; 5 6 7 8; 9 10 11 12];
```

```
1 2 3 4
```

```
5 6 7 8
```

```
9 10 11 12
```

```
arr4=(2:3, 2:4);
```

```
6 7 8
```

```
10 11 12
```

Subarrays

- `arr4=[1 2 3 4; 5 6 7 8; 9 10 11 12];`
`arr4(1:2,1:2) =`

1 1 3 4

1 1 7 8

9 10 11 12

Loop calculations

- $a = [3 \ 40 \ 1 \ 8 \ 0];$
- $b = [-7 \ 5 \ -4 \ 16 \ 1];$

for $i = 1:5$

$c(i) = a(i) + b(i);$

$c = [-4 \ 45 \ -3 \ 24 \ 1];$

Doubly-nested loop

```
arr4=[1 2 3 4; 5 6 7 8; 9 10 11 12];
```

```
1  2  3  4
5  6  7  8
9 10 11 12
```

```
for i=1:3
    for j=1:4
        arr4(i,j)
    end
end
```

Another nested for loop

```
for i=1:5  
    for j=1:5  
        a(i,j)=10*i+j;  
    end  
end
```